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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/914,103	08/22/2001	Chang Je Cho	P/2803-42	9636

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OSTROLENK FABER GERB & SOFFEN  
1180 AVENUE OF THE AMERICAS  
NEW YORK, NY 100368403

EXAMINER

MONDT, JOHANNES P

ART UNIT	PAPER NUMBER
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2826

DATE MAILED: 07/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/914,103

Applicant(s)

CHO, CHANG JE

Examiner

Johannes P Mondt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 September 2002 and 11 March 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

NATHAN J. FLYNN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Priority***

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1. Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 120 as follows:

It is a requirement that the specific reference to any prior nonprovisional application must include upon allowance the relationship (i.e., continuation, divisional, or continuation-in-part) between the applications except when the reference is to a prior application of a CPA assigned the same application number. In the present case the following sentence meets this requirement:

“The present application is a continuation of International Application No. PCT/KR00/00119 filed on February 15, 2000, the entire disclosure of which is incorporated herein by reference. “

Once more, although acknowledgment is made of applicant's claim for foreign priority based on an application filed in Paper No. 3 on 08/22/01, it is noted that applicant has not filed a certified copy of the application for a patent in Korea as required by 35 U.S.C. 119(b).

### ***Response to Amendment***

Amendment A filed 9/25/2 and Supplemental Submission and Declaration under 37 C.F.R. § 1.132 filed 3/11/3 following Applicant's Petition to Suspend action by the Office under C.F.R. 103(a) (Paper No. 7) have been entered as Papers No. 6 and 9,

respectively. This Office Action is based on Papers 6, 7, and 9. Comments on Remarks by Applicant in traverse of the rejections by the Office in Office Action of Paper No. 4 are included below under "Response to Arguments".

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The Supplemental Submission and Declaration under 37 C.F.R. § 1.132 filed 3/11/3 is insufficient to overcome the objection to the specification and the rejection of claims 1-3, nor of amended claims 1-3 and newly added claims 4-10 based upon a disclosure that is not enabling and that lacks patentable utility as set forth in the last Office action because:

Despite the requirement that Applicant must provide a plot of entropy as a function of time or the equivalent of it, in a manner that enables a straightforward verification of Applicant's statement that his invention contradicts the second law of thermodynamics and that the rectifying function of the device is able to operate without supply of energy (cf. Office Action of Paper No. 4, page 2) said Applicant's statement remains fully unsubstantiated, because Applicant has provided no such plot. The only plot Applicant provided is based on Table 1, showing the voltage output of the device versus real time, but without any error bars and without any explanation why this plot cannot be explained within the context of theory that does not contradict the second law of thermodynamics. Therefore, Applicant provides both the wrong kind of information and the wrong quality of information. A plot without error bars as evidence of the existence of a phenomenon is meaningless, because only through data on both the mean and variance do we know anything at all on the probability distribution of values represented by numerical data. Applicant also completely discarded to subtract from the

voltage listed in the data of Table 1 well known other sources of voltage such as are predicted according to the well-established physics of non-equilibrium statistical thermodynamics. The creation of a voltage due to a difference in the chemical potential and/or temperature between two abutting substances has long been known, with reference to any standard textbook on statistical thermodynamics. Why, then, is there no comprehensive discussion showing that the voltage plotted based on the data of Table 1 is the difference from what is expected on the basis of conventional theory including the nano-scale monolayer as claimed in amended application?

Consequently, in the underlying case, neither the statistical significance of the allegedly measured voltage nor the source of the allegedly measured voltage can be ascertained at all based on the Supplemental Submission by Applicant, because (a) no error bars have been presented, (b) a fortiori no error analysis is available to explain the size of the possible error in the measurements, and (c) no estimate is given of the expected voltage predicted according to perfectly conventional statistical theory when one connects two substances with different chemical potential and/or different temperature (the latter may arise, for instance, due to the difference in ohmic heating caused by a difference in electrical conductivity, given the former).

In light of the aforementioned shortcomings of the Supplemental Submission, and thus of the Disclosure by Applicant, the examiner concludes that the independent claim 1 is not enabled. The following rejections reflect this conclusion, and in addition, contains the objection to the specification flowing as before from the still present and still unsubstantiated statement by Applicant that his device invention contradicts the

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second law of thermodynamics (see first paragraph of Amendment A in clean version) and operates without the supply of energy (see page 4 of unamended portion of the disclosure, particularly lines 6-9).

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Furthermore, and most surprisingly, with regard to the aforementioned Declaration under 37 C.F.R. 1.132:

the material characterization of the "metal particles" is in stark contrast with the Declaration under 37 C.F.R. 1.132, because

(1) Ge (i.e., germanium) is not a metal but instead is a semiconductor (see page 1, step 5, ad 1.1 and page 2, step 2 ad 1.2); while

(2) nothing in either the original specification or the aforementioned Declaration explains how the "metal" particles are uniformly distributed (page 35, lines 10-15), or even

(3) how they are made to be of uniform size (page 35, lines 10-15). It is therefore concluded that said Declaration does not substantiate but instead seriously contradicts Applicant's Specification.

Finally, no art rejections under 35 U.S.C. 102 or 103 are included in this Office Action because no device is known to exist wherein an ambient temperature of said apparatus in a thermal equilibrium state is converted by itself so that said apparatus continuously produces a DC electromotive force.

***Response to Arguments***

1. Applicant's arguments filed with Amendment A in traverse of the objection to the specification, and the rejections of claims 1-3 under 35 U.S.C. 112 and 35 U.S.C. 101 have been fully considered but they are not persuasive. With regard to the objection to the specification: the verbiage "without supply of energy" as stated in the specification has common meaning and cannot be forced to mean "without a low temperature heat source". With regard to the traverse of the rejections under 35 U.S.C. 112 and 35 U.S.C. 101, Applicant for the reasons given above (see "Response to Amendment" and "Specification") remains in the position that his disclosure fails to enable how his device "contradicts the second law of thermodynamics" (cf. e.g., page 5 line 5), and, parenthetically also fails to disclose that his device operates under a law different from that of the second law of thermodynamics (as alleged on page 9 of Amendment A), because no comparison has been made between the data and what is expected by applying conventional theory, and no effort has been made to present a true data plot by including error bars based on a comprehensive inclusion of error sources as is common in the physical sciences. No traverse on the specifics of the art rejections (35 U.S.C. 102(b) and 103(a)) in the previous Office Action has been presented other than the allegation that the newly amended claims 1-3 and new claims 4-10 do not allow a repetition of said art rejections.

Indeed, as mentioned above under "Response to Amendment", no art rejections under 35 U.S.C. 102 or 103 are included in this Office Action because no device is known to exist wherein an ambient temperature of said apparatus in a thermal

equilibrium state is converted by itself so that said apparatus continuously produces a DC electromotive force.

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***Specification***

1. Although the amendments to the specification can hereby be accepted as not altering the content so as to introduce new matter, the previously made objection to the specification must be maintained for the aforementioned reasons because only minor linguistic informalities have been corrected through said amendments.

Applicant's statement that his invention contradicts the second law of thermodynamics and the rectifying function of the device as being able to operate without supply of energy are unsubstantiated, considering the absence of a plot of entropy as a function of time or the equivalent of it. Applicant should provide that plot in a manner that enables a straightforward verification of said statement or withdraw all reference to the device as a rectifier and the rectifying function of said device in the sense given to this term by Applicant, namely as a device and function, respectively, capable of defying the second law of thermodynamics, to operate without the supply of energy, or the physical equivalent of such statements.

2. Furthermore, the specification is inconsistent with the Declaration under 37 C.F.R. 1.132 referred to above:

The material characterization of the "metal particles" is in stark contrast with said Declaration, because Ge (i.e., germanium) is not a metal but instead is a semiconductor (see page 1, step 5, ad 1.1 and page 2, step 2 ad 1.2); while nothing in either the



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original specification or the aforementioned Declaration explains how the metal particles are uniformly distributed (page 35, lines 10-15), or even how they are made to be of uniform size (page 35, lines 10-15), *a fortiori* not how the metal particles are regularly dispersed (cf. page 36, lines 3-6). Great effort is required to provide any regularity of an array of nano-sized particles because the scale of regularity necessarily also is in the nanometer range, while nothing is mentioned about how this is arranged.

Applicant should resubmit the specification with all material pertaining to the above mentioned objections fully removed. Application should additionally explain how metal particles of nanometer size have been inserted in the apparatus fully within the context of the steps as delineated in said Declaration under 37 C.F.R. 1.132.

**Appropriate action is required.**

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. ***Claims 1-10 are rejected*** under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. The capability of the “rectifier” device of claims 1 – 2 and the “method for converting thermal energy into electrical energy by rectifying thermally moving electrons by utilizing a rectifier” of claim 3 of Applicant to convert thermal electron energy into electrical energy through violation of the law of

thermodynamics (see pages 4 – 6 in particular), while critical or essential to the practice of the invention, but not included in the claims, is not enabled by the disclosure. Claims 4-10 depend on claim 1, thus containing at least the same un-enabled subject matter.

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In particular, in Applicant's disclosure there are no verifiable data on the behavior of entropy of the system of Applicant as a function of time. Thus far, during worldwide experimentation ever since the formulation of the second law of thermodynamics, no reproducible violation has ever been found. This fact a fortiori requires Applicant to provide the aforementioned verifiable data as a necessary requirement for enablement. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

3. **Claims 1-10** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention. The claimed "monolayer" (claim 1, line 5) is not disclosed in the Specification and hence constitutes *new matter*, instead said "minute particles are regularly and uniformly dispersed in one layer" (page 36, lines 3-6), not "as a monolayer". The sketchy representation by Figure 1 is not a substitute for careful disclosure, nor does Figure 1 even begin to suggest a monolayer, merely isolated minute particles: "Monolayer", according to Merriam-Webster, Collegiate Dictionary, tenth Edition means "a single continuous layer or film that is one cell or molecule in thickness".

***Claim Rejections - 35 USC § 101***

3. 35 U.S.C. 101 reads as follows:

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Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The claimed invention lacks patentable utility. In the absence of reproducible and statistically meaningful data in support of Applicant's statement that the "apparatus" device of claims 1 – 9 and the "method of obtaining a desired DC electromotive force" of claim 10 contradicts the second law of thermodynamics, said "apparatus" of claims 1 – 9 and said "method of obtaining a desired DC electromotive force" of claim 10 lack enablement, as detailed above under item 2. In view of this lack of enablement, said "apparatus" of claims 1-9 and said "method of obtaining a desired DC electromotive force" of claim 10 are also lacking in patentable utility.

***Conclusion***

2. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Johannes P Mondt whose telephone number is 703-306-0531. The examiner can normally be reached on 8:00 - 18:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J Flynn can be reached on 703-308-6601. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

JPM  
July 7, 2003

NATHAN J. FLYNN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800

